

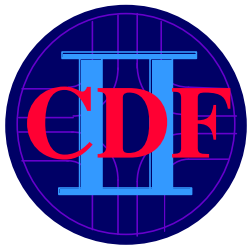


Calorimeter High Voltage



Steve Hahn
Calorimeter HV
02/10/2003

- Yimei pointed out calorimeter HV info out-of-date; this is my correction
- Amalgam of web info from Simone dell'Agnello (5/01) and ace talk I gave (12/01) and new info
- Players:
 - Fermilab: Steve Hahn (CEM, xenon, HV, iFIX), Nikolay Luzhetskiy (HV, iFIX)
 - Argonne: Larry Nodulman (SPL), Bob Wagner (CEM, HV)
 - U. of Rochester: Willis Sakamoto (SPL), Howard Budd (plug, HV)
 - UCLA: Mike Lindgren, Alon Attal (plug, HV)
 - Frascati, INFN: Marco Cordelli, Simone dell'Agnello, Fabio Happacher, Stefano Miscetti, Fotis Ptohos, Andrea Sansoni (CHA, WHA, HV, iFIX)
 - Bologna, INFN: Luciana Malferrari, Stefano Zuchelli (plug, HV, iFIX)
 - ITEP: Konstantin Kotelnikov, Irina Schreiber (HV, iFIX)
- First the summary, then the details!

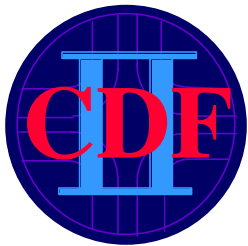


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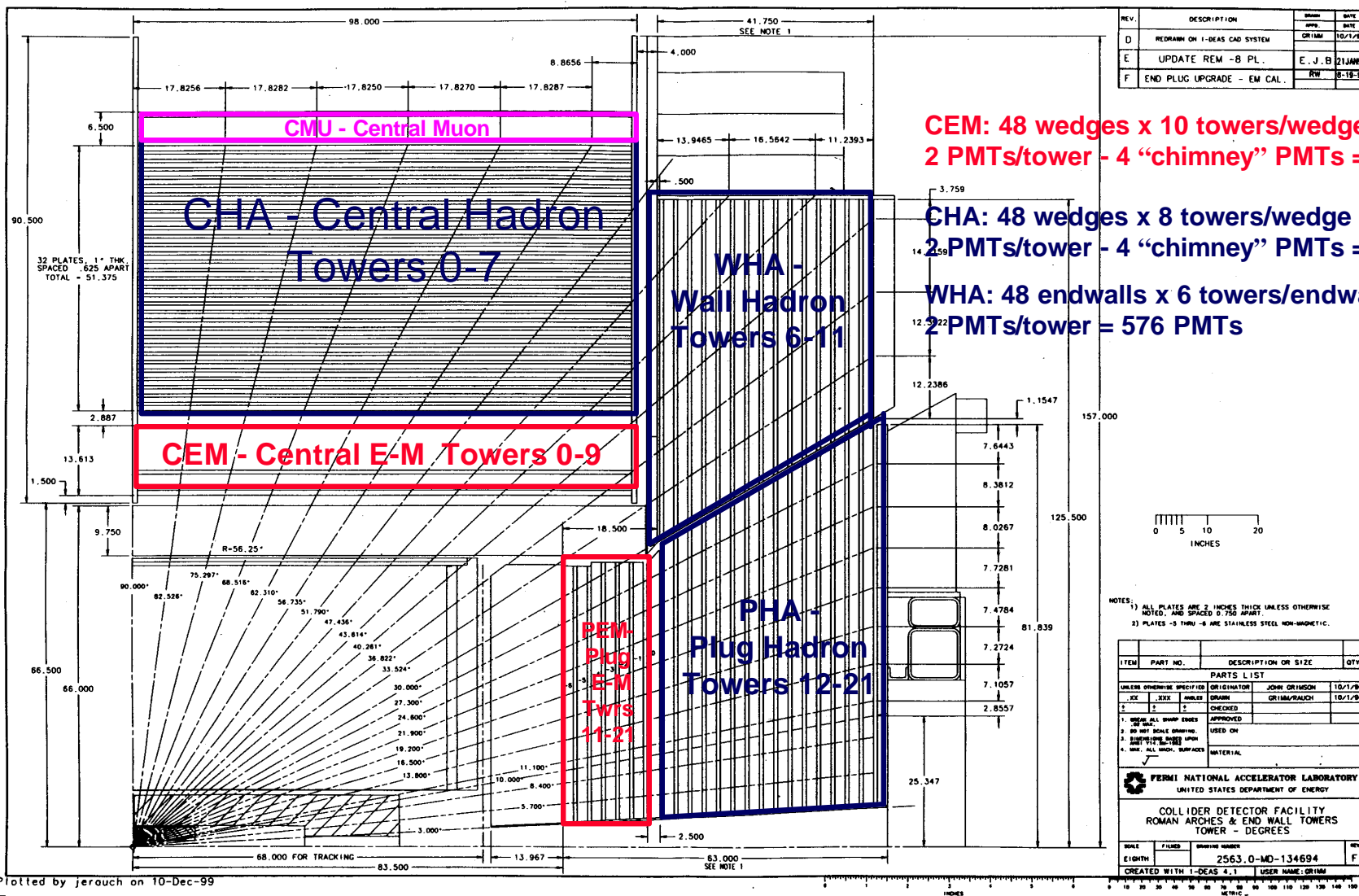
- CEM (central E-M), CHA (central hadron), WHA (wall hadron):
 - HV for arches and walls generated in Gamma HV supplies on 1st floor. Voltage divider on back of Gamma provides readback and fast trigger inhibit via APACS and CDFS5 in cryo area
 - Distributed via “daisy chain” to Pisaboxes in one arch or one wall
 - Pisabox distributes, sets, and reads HV for each phototube in one central wedge or several endwall modules; controlled from PISABOX on 1st floor
 - CEM xenon flashers (one per wedge) also need HV, supplied from two CAEN 127s on 1st floor; also controlled by PISABOX
- PEM (plug E-M), PHA (plug hadron), PES (plug strip):
 - HV for two “PMT boxes” generated and distributed to phototubes by CAEN 527 mounted on plug fixture; set and read via CDFEPHV on 3rd floor. Status output provides fast trigger inhibit.



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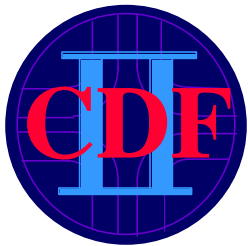


REV.	DESCRIPTION	BY	DATE
D	REDRAWN ON I-DEAS CAD SYSTEM	GRIMM	10/1/90
E	UPDATE REM -8 PL.	E. J. B	01/10/91
F	END PLUG UPGRADE - EM CAL.	RW	0-10-92

NOTES:

- ALL PLATES ARE 2 INCHES THICK UNLESS OTHERWISE NOTED, AND SPACED 0.750 APART.
- PLATES -3 THRU -8 ARE STAINLESS STEEL NON-MAGNETIC.

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED	ORIGINATOR	JOHN GRIMM	10/1/90
EX	XXX	AWLES	GRIMM/RAUCH
1	2	CHECKED	
2	2	APPROVED	
1. USE ALL SHARP EDGES			
2. DO NOT SCALE DRAWING			
3. SURFACES BASED UPON			
4. USE ALL UNDO SURFACES			
MATERIAL			
FERMILAB NATIONAL ACCELERATOR LABORATORY			
UNITED STATES DEPARTMENT OF ENERGY			
COLLIDER DETECTOR FACILITY			
ROMAN ARCHES & END WALL TOWERS			
TOWER - DEGREES			
SCALE	FILED	DRAWING NUMBER	REV.
EIGHTH		2563.0-MD-134694	F
CREATED WITH I-DEAS 4.1 USER NAME: GRIMM			



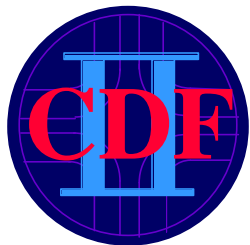
Central Calorimeter HV Distribution ⚡

Steve Hahn
Calorimeter HV
02/10/2003



- Gamma HV bulk power supplies
 - Up to 2000 V @ 100 mA each
 - Two racks on 1st floor
 - HV racks tripped if flammable gas alarm
 - Voltage dividers on back provide remote readout to APACS chassis via node CDFS5
- Pisabox (on wedges and walls)
 - HV distribution only
 - Chassis with three boards: top two HV distribution boards (20 channels each), bottom microprocessor board
 - HV boards “daisy chain” HV via HV inputs on left; processor boards “daisy chain” CAEN serial via LEMO cables
 - HV set with potentiometers connected to motors
 - HV readback via slow ADC—0.5 sec/channel

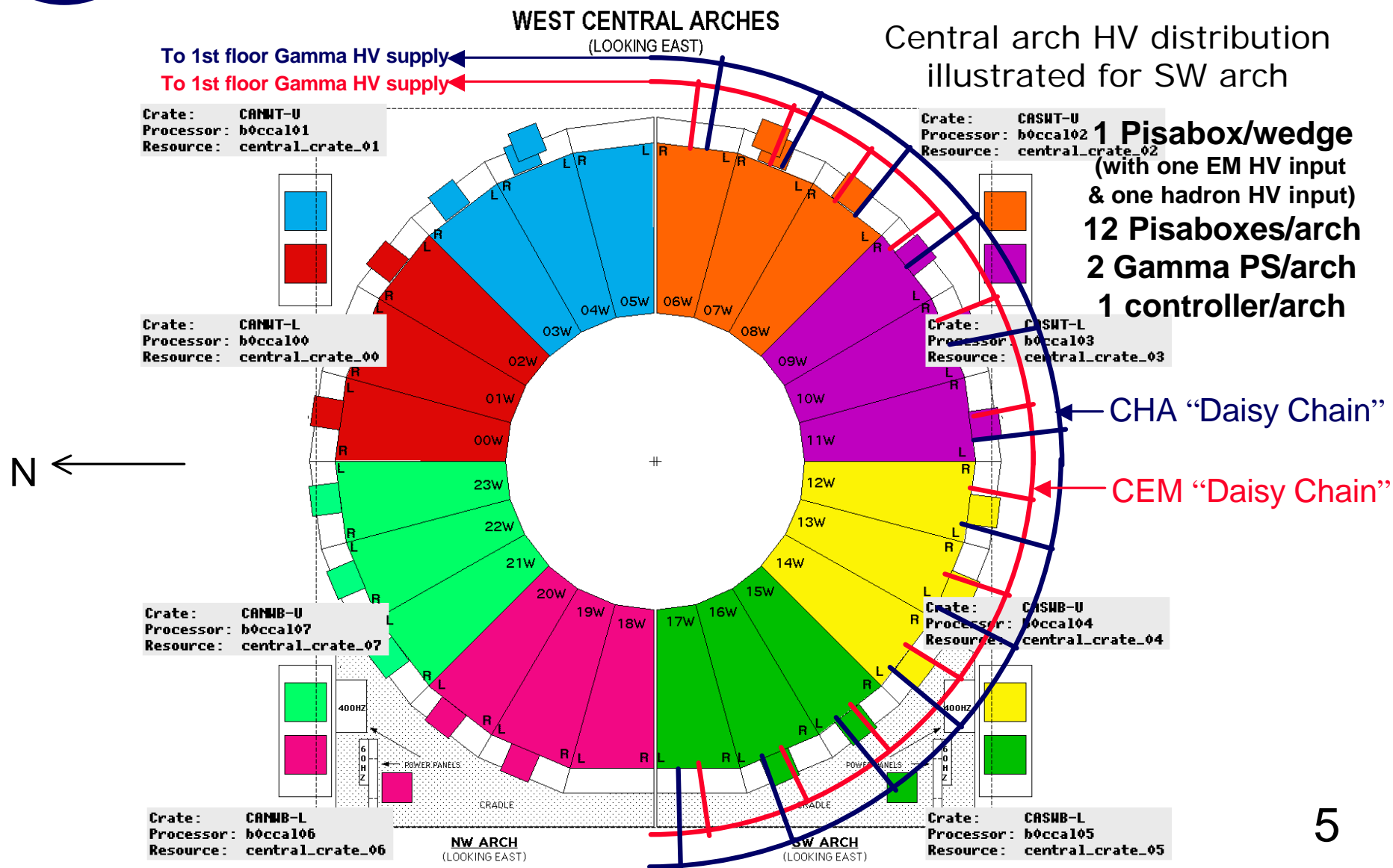


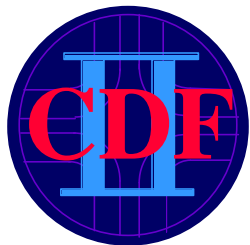


Central Calorimeter HV Distribution



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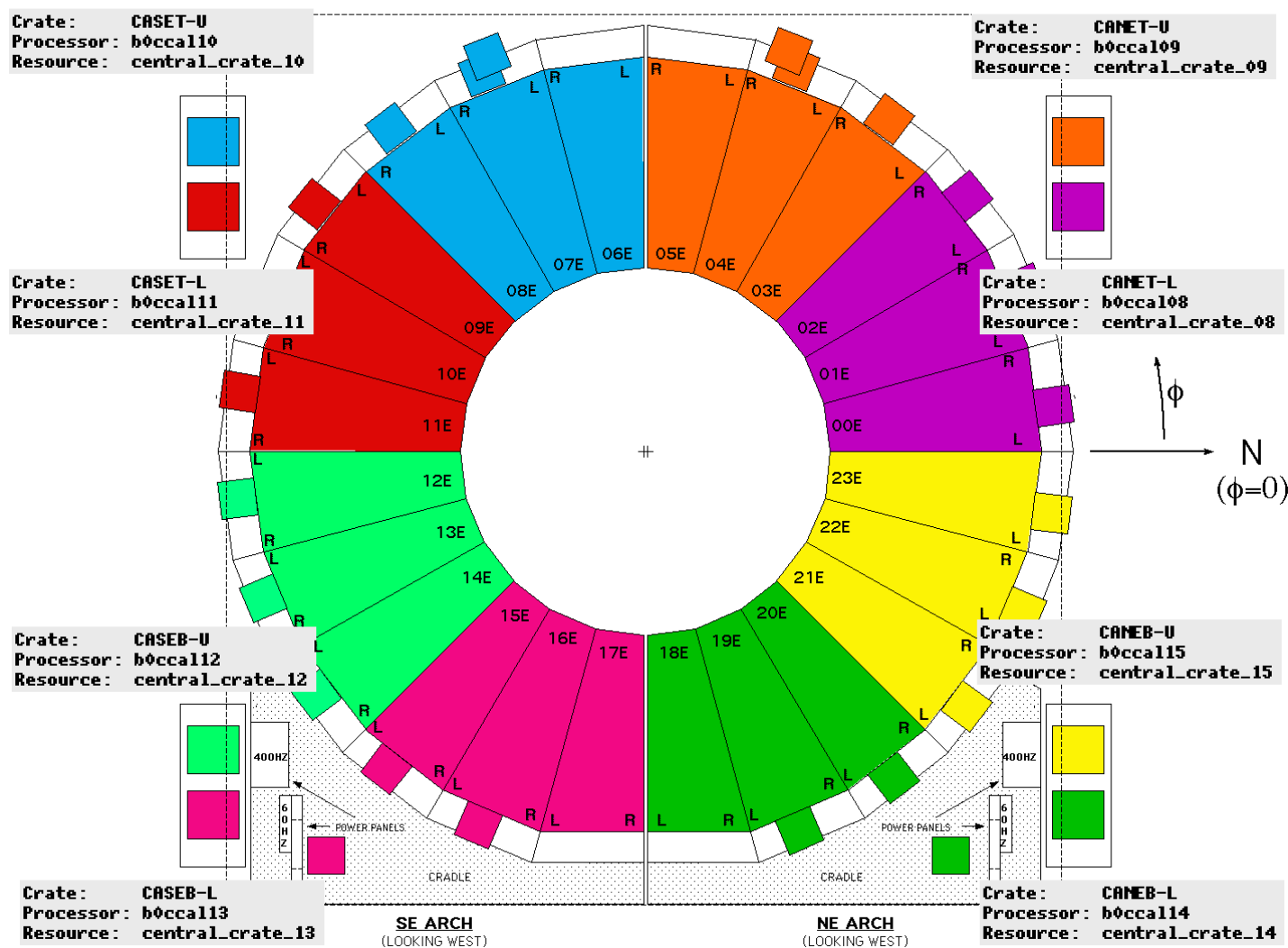


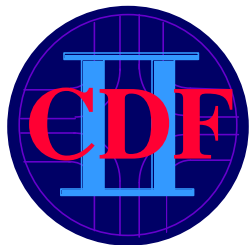
Central Calorimeter HV Distribution



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EAST CENTRAL ARCHES (LOOKING WEST)

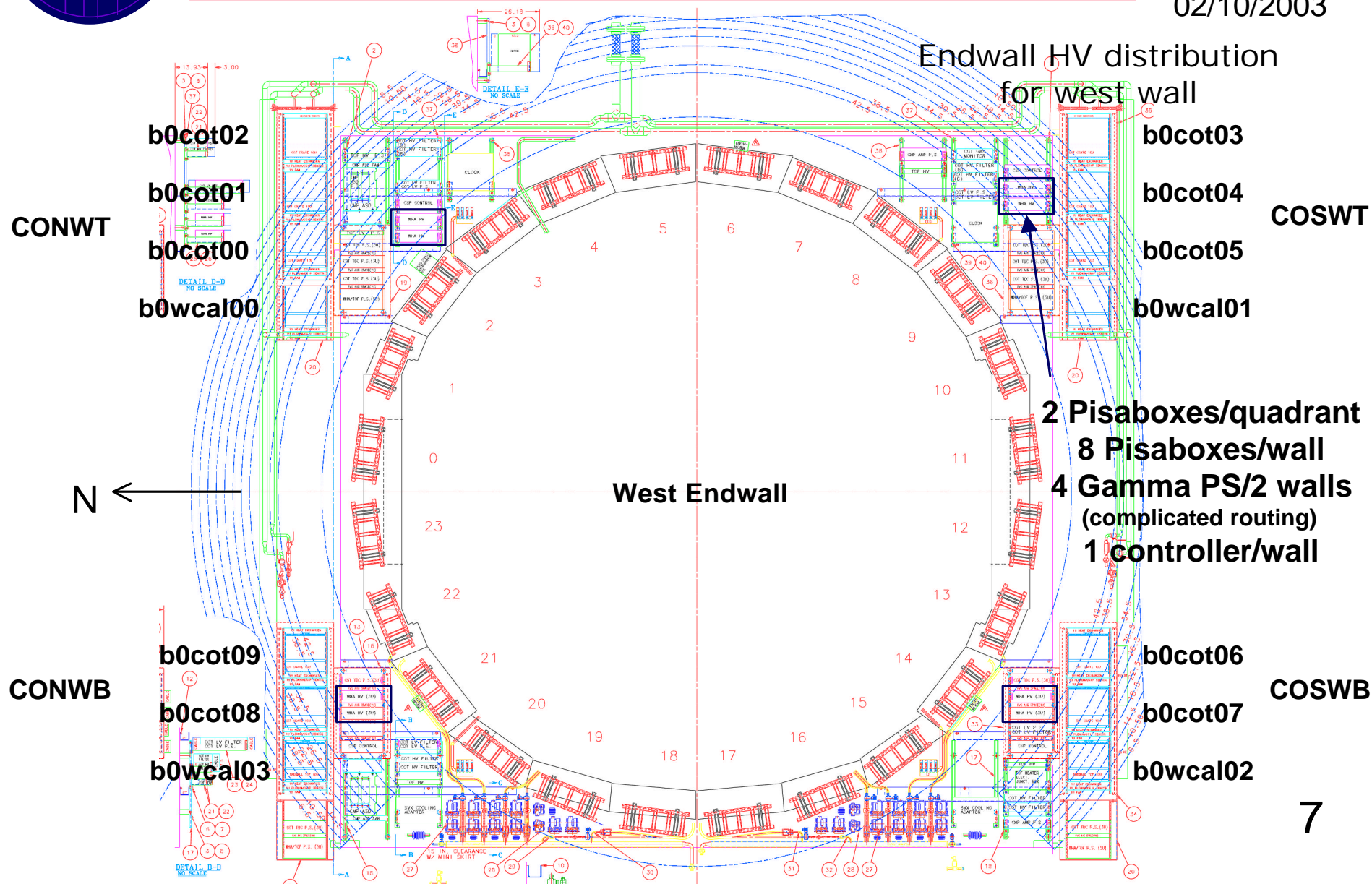


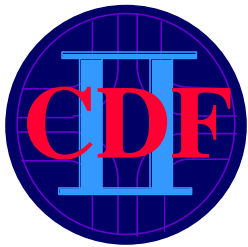


Endwall Calorimeter HV Distribution



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Calorimeter HV
02/10/2003





Endwall Calorimeter HV Distribution

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Calorimeter HV
02/10/2003

COSET

b0cot13

b0cot14

b0cot15

b0wcal05

b0cot12

b0cot11

CONET

b0cot10

b0wcal04

East Endwall

N

COSEB

b0cot16

b0cot17

b0wcal06

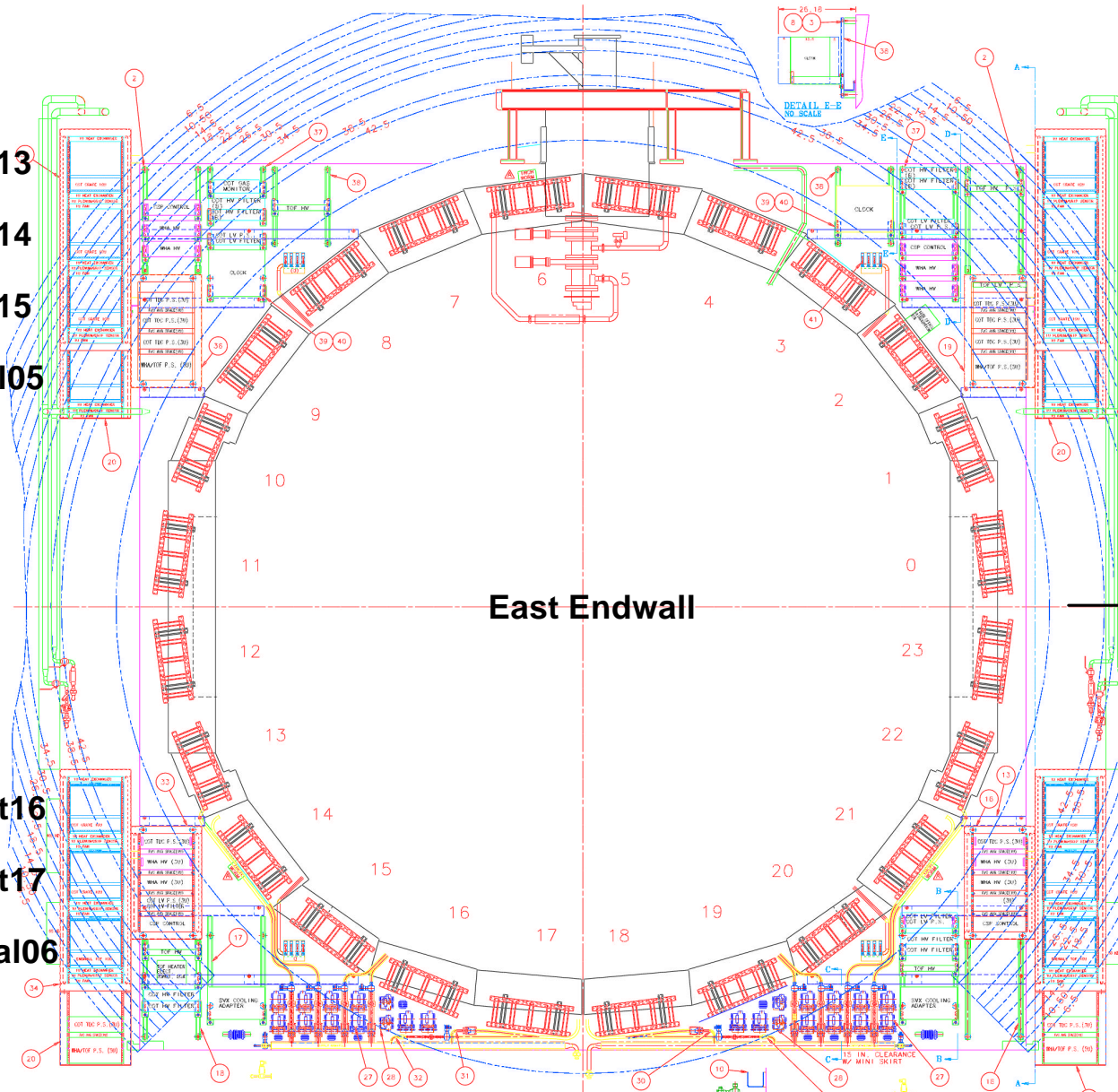
b0cot19

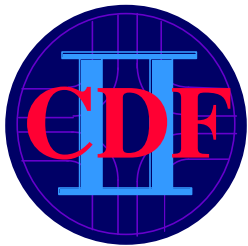
b0cot18

b0wcal07

CONEB

8





Gamma HV Monitoring

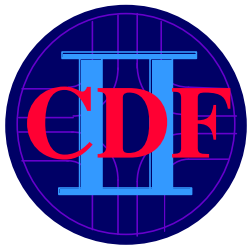


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Calorimeter HV
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DEVICE	DESCRIPTION	LO LIMITS	CURRENT VALUES	HI LIMITS	Audible Alarm
CSX NW	Voltage Indication	2122	2127 V	2132	
	Current Indication	-2	-0 mA	5	
CSX SW	Voltage Indication	2113	2118 V	2123	
	Current Indication	10	69 mA	72	
CSX NE	Voltage Indication	1974	1991 V	2003	
	Current Indication	10	61 mA	72	
CSX SE	Voltage Indication	2135	2140 V	2145	
	Current Indication	10	61 mA	72	
CEM NW ARCH	Voltage Indication	1240	1246 V	1250	
	Current Indication	10	51 mA	72	
CHA NW ARCH	Voltage Indication	1727	1733 V	1737	
	Current Indication	10	62 mA	72	
CEM SW ARCH	Voltage Indication	1243	1248 V	1253	
	Current Indication	10	49 mA	72	
CHA SW ARCH	Voltage Indication	1746	1751 V	1756	
	Current Indication	-2	-0 mA	72	
CEM NE ARCH	Voltage Indication	1279	1286 V	1289	
	Current Indication	10	49 mA	72	
CHA NE ARCH	Voltage Indication	1724	1727 V	1733	
	Current Indication	-2	-0 mA	72	
CEM SE ARCH	Voltage Indication	1234	1240 V	1244	
	Current Indication	10	47 mA	72	
CHA SE ARCH	Voltage Indication	1729	1734 V	1739	
	Current Indication	-2	-0 mA	72	
CSP NORTH	Voltage Indication	2112	2120 V	2122	
	Current Indication	10	60 mA	72	
CSP SOUTH	Voltage Indication	2113	2121 V	2133	
	Current Indication	10	68 mA	72	
SVX INCHWORM	Voltage Indication	-2	-0 V	8	
	Current Indication	-2	-0 mA	5	
MINISKIRT ARCH	Voltage Indication	1916	1919 V	1926	
	Current Indication	10	38 mA	72	
WHA 1	Voltage Indication	1063	1074 V	1075	
	Current Indication	10	40 mA	72	
WHA 2	Voltage Indication	1186	1191 V	1196	
	Current Indication	10	54 mA	72	
WHA 3	Voltage Indication	1286	1290 V	1296	
	Current Indication	-2	-0 mA	72	
WHA 4	Voltage Indication	1307	1312 V	1317	
	Current Indication	-2	0 mA	72	

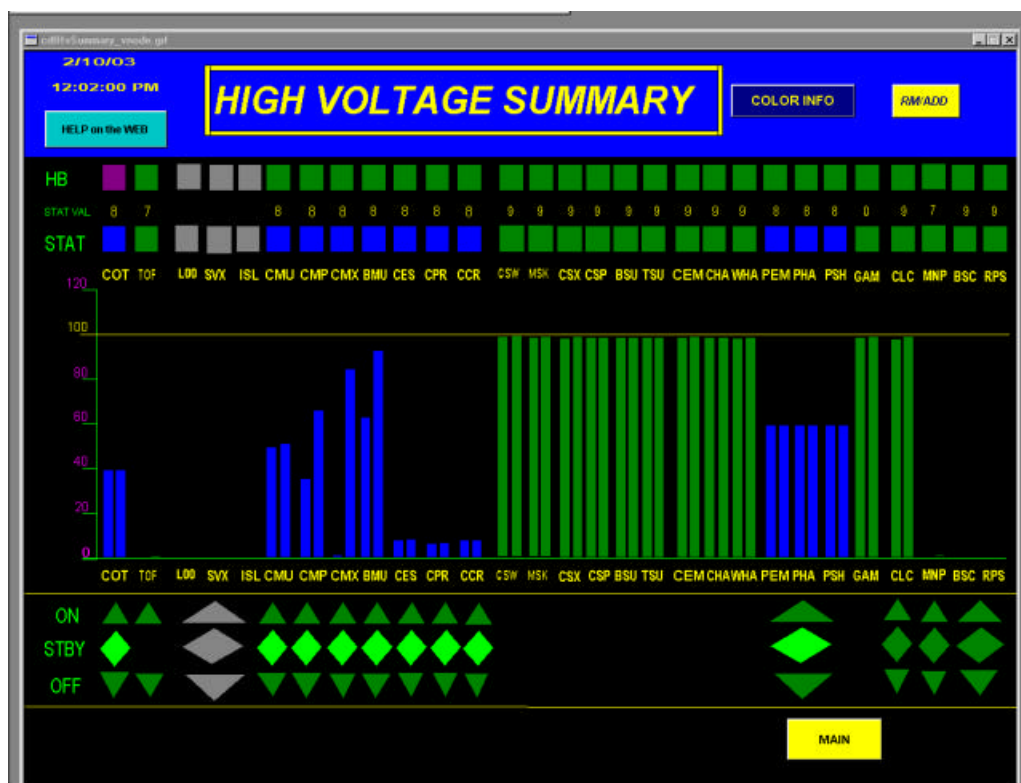
● Gamma HV readout

- Runs on CDFS5, not any longer on PISABOX
- Main CDF menu (click on any CDF logo) → Misc. menu → **Gamma** (same color as global alarm box)
- Updates @ 30 Hz
- Any Gamma outside limits of ± 5 V from nominal generates trigger inhibit, audible alarm, GAM global alarm box turns red, and current value on this display turns red



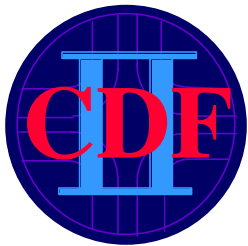
☁ Calorimeter PMT HV Monitoring ⚡

Steve Hahn
Calorimeter HV
02/10/2003



● PISABOX PMT readout

- Takes 25 minutes to readout sequentially CHA CEM WHA, then waits 2 hours to cycle
- If PMTs out of range, bars and global alarm boxes will go yellow (± 3 V) or red (± 5 V) and slow trigger inhibit will occur
- Clicking “D” on global alarm box will bring up DBANA-like map of all PMT voltage deviations
- If bars deviate from 100% noticeably but no alarm, notify experts
- HV control by experts only, normally always on

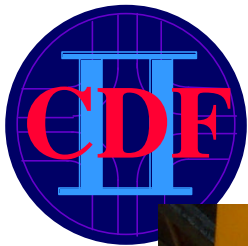


PISABOX iFIX node



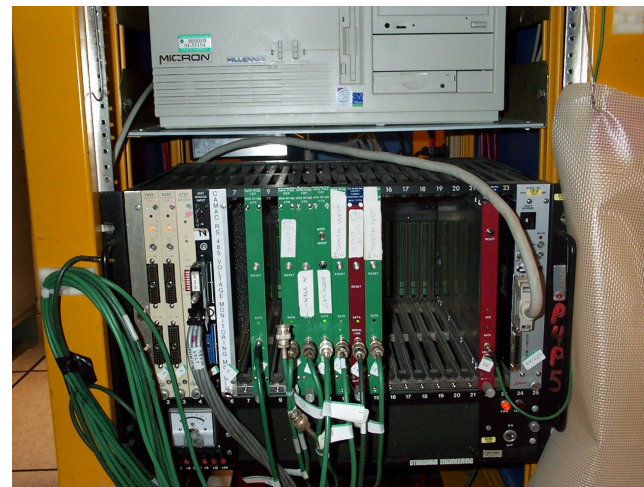
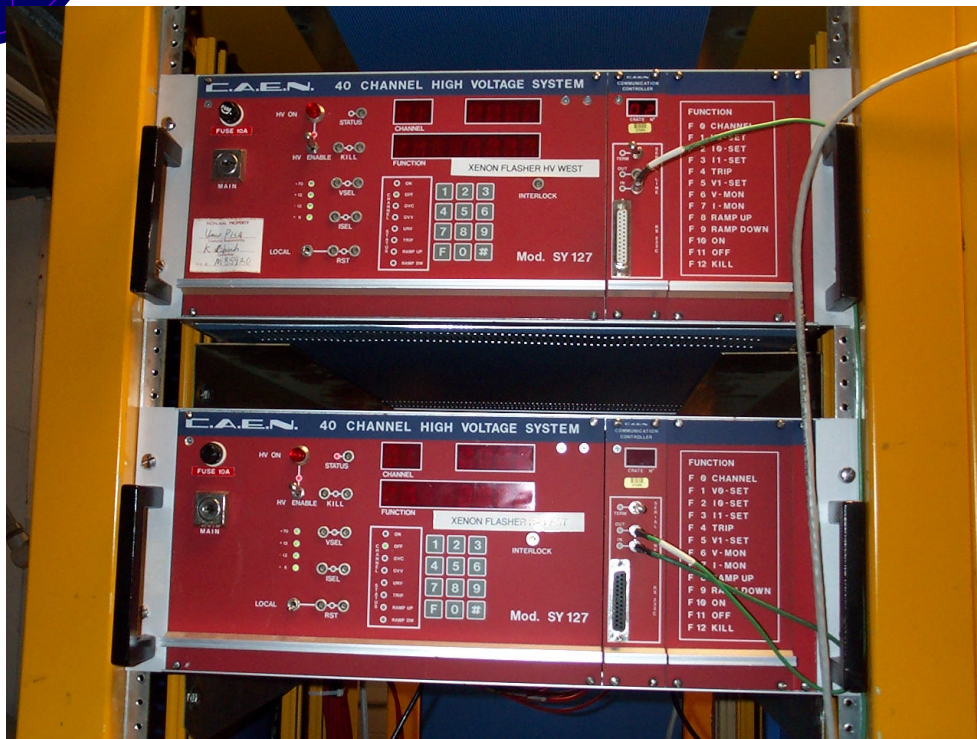
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Calorimeter HV
02/10/2003

- Pisabox computer on 1st floor controls two processes:
 - Pisabox PMT readout (every 2 hours)
 - Xenon HV control and readout (during CEM xenon calibration only)
- Unfortunately, CAMAC accesses between Xenon HV process and Pisabox/Gamma readout processes causes errors
 - Must kill Pisabox readout before ramping up Xenon HV. Note CEM CHA WHA GAM bars on high voltage display will eventually all go gray.
 - **Must log out and back in** to Pisabox account to restart Pisabox and Gamma readouts. This is **VERY IMPORTANT!** If you do not, you will no longer be monitoring PMT HV status. Starts reading PMT HVs immediately, so gray bars should turn green within 1/2 hour.

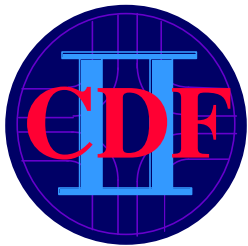


☁ Xenon HV Distribution and Control ⚡

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02/10/2003



- Xenon HV (2850 V to each xenon flasher box on each wedge)
 - Two CAEN SY127s above PISABOX computer
 - Should see activity on front panel while ramping HV up or down
 - Readout via CAEN SY127 CAMAC interface (as are Pisaboxes in CAMAC crate below computer) and CAMAC Jorway interface in PISABOX computer



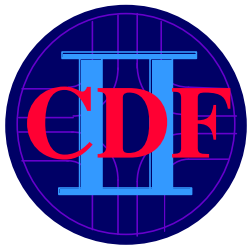
Xenon HV Instructions



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Calorimeter HV
02/10/2003

Xenon HV instructions:

- Go to the Pisabox PC in 1RR06C; it should be running and logged into the CDF-PISABOX account (this is the PC user account, not the iFIX login). You will need to know the password for this account; if you do not, contact the operations manager to get it.
- If the workstation is locked, unlock it and enter the username (it should come up with CDF-PISABOX as the default) and password.
- Kill the PMT HV readout process. There should be a window named C:\PB\PBHVOUT\PB_V6.EXE; close (not minimize) this window to kill the process. Note that while the PMT HV process is not running, the CEM, CHA, WHA, and GAM HVs on the iFIX "High Voltage Summary" will eventually go to zero.
- Start the "Xenon HV" process. If you do not see it, start it up by double-clicking on the "Xenon HV" icon on the desktop.

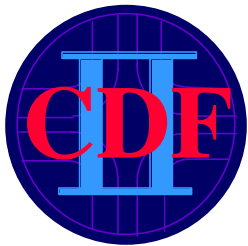


Xenon HV Instructions



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- Maximize the "Intellution iFIX WorkSpace" if it is minimized. If there is no "Intellution iFIX WorkSpace" process, start it from the "Start" menu: Programs -> iFIX -> Intellution iFIX WorkSpace. Click on the "OPEN" item in the "FILE" menu. Assuming you are starting from the S:/dynamics/Pic folder, open the "Cdfmcs" folder, then open the "MUON" folder. Double-click on the file "Xenon Flashers". The "Xenon Flashers" HV display should appear.
- Turn on all the xenon flashers:
 - First try just clicking on the "All Flashers" button, and then the "ON" button to turn on all xenon flashers' HVs. If all 48 wedges ramp up to green (full HV) after two minutes, you are done.
 - If nothing happens or only a few wedges turn on, you may have to turn on each arch individually. Click one at a time on the "SE", "NE", "SW", "NW" buttons and then the "ON" button. Remember to unclick the previous arch's button before proceeding to the next arch.
 - **Some individual wedges may need special attention. See special instructions at end of this procedure for any such cases.**
- Run the CEM xenon flasher calibration with RUN_CONTROL.



Xenon HV Instructions



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- When you are done, turn all xenon flasher HVs off. Click "All Flashers" (if it is not already selected) and then "OFF". When all wedges have turned black (HV off), "CLOSE" the xenon flasher display.
- When you are done, turn all xenon flasher HVs off. Click "All Flashers" (if it is not already selected) and then "OFF". When all wedges have turned black (HV off), either minimize or close the "Intellution iFIX Workspace" and close (not minimize) the "Xenon HV" window to kill this process.
- Now restart the PMT HV readout process by double-clicking the "PMT HV" shortcut icon on the desktop. It may take up to half an hour for the CEM CHA WHA HV bars to reappear on the HV summary.
- Special instructions for individual wedges (click on the individual wedge in the xenon flasher display; click "OK" when done):
 - 17E may require you to turn it on or off individually. However, it seems to ramp on or off correctly after doing this.
 - 23E has been deliberately set to 2861 V instead of the usual 2850 V. It may end in a "software undervoltage" state with the voltage at 2845 V. This should be OK. The suspicion is that the CAEN readback is not working correctly for this channel.